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Use of Red-winged Blackbird nest by a Prothonotary Warbler.—Apart from the use of old woodpecker holes, reports of cavity-nesting birds using nests (particularly open-cup nests) built by other species are rare. Interspecific nest use has more commonly been reported in open-nesting species (e.g., Finch, *Wilson Bull.* 94:582–584, 1982). We document here the first case of a Prothonotary Warbler (*Protonotaria citrea*), a cavity-nesting wood-warbler of swampy or riparian habitat, using an open-cup nest built by another bird species. Prothonotary Warblers have been known to nest rarely in some unusual man-made nest sites (Bent, U.S. Natl. Mus. Bull. 203, 1953), all of which resembled natural cavities to some extent. The nesting we report here occurred when all suitable natural cavities and nest boxes in the vicinity were unavailable due to an extremely high local density of Prothonotary Warblers.

The study site is located along the Tennessee River in Benton County, Tennessee. As part of a larger study on the reproductive ecology of Prothonotary Warblers (Petit, L., M.S. thesis, Bowling Green State Univ., Bowling Green, Ohio, 1986), nest boxes were erected in linear fashion along the river shoreline in densities of 0, 8, and 20 nest boxes per 300 m. On 1 June 1987, an unbanded male Prothonotary Warbler was observed on one of the high density nest box plots defending a small (0.08 ha) territory which did not encompass any of the 20 boxes present. Territorial boundaries were determined from >2 h of observation on that day. Vegetation on the territory consisted of a small knob of willows (*Salix* spp.) and buttonbush (*Cephalanthus occidentalis*) that extended into the river from the main contour of the shoreline. The male was apparently unmated, as no female was observed in his territory in 1 h of intensive observation. Probst and Hayes (*Auk* 104:234–241, 1987) found that 1–1.5 h of observation was sufficient to determine pairing success of Kirtland's Warblers (*Dendroica kirtlandii*). Six mated males also occupied territories on the plot, five of them within a 150 m length of shoreline adjacent to the male's territory. This represents a density of Prothonotary Warblers six times greater than that occurring naturally in this habitat (Petit 1986). Collectively, those 6 males defended all 20 nest boxes and two natural cavities on the plot, rendering them unavailable to the unmated male. There was one woodpecker cavity located within the unmated male's territory, but it was occupied by Tree Swallows (*Tachycineta bicolor*).

The male was observed on several days during the following week, and on 9 June, an unbanded female Prothonotary Warbler was seen foraging within his territory. The female entered a Red-winged Blackbird (*Agelaius phoeniceus*) nest that was situated approximately 1 m above water in the crotch of a branch of a 2-m-tall buttonbush. The female remained on the nest for approximately 5 min before leaving to forage again. The nest contained 2 Prothonotary Warbler eggs, and it was lined with a thin layer of moss along the inner walls of the nest cup. During 1 h of observation (12:00–13:00), the female incubated three times

for an average of 6.7 min/bout. Although some foliage was present above the nest, the female was still quite exposed to the midday sun and could be seen panting. We color-banded the male the same day. Sometime before 17 June the nest was depredated. Although the actual clutch size was not determined, incubation on 9 June meant that the clutch size probably was not >3 eggs, as Prothonotary Warbler females begin incubation once the penultimate egg is laid (Petit 1986). Average clutch size for this population is 4.6 and <10% of all clutches are ≤ 3 eggs (Petit 1986).

On 17 June we observed that the male had expanded his territory after three neighboring males had eased territorial defense while feeding fledglings. The expanded territory (based on the male's singing posts) included five nest boxes and encompassed an area of approximately 0.15 ha. On 26 June an unbanded female was incubating 4 eggs in a nest box located within the male's expanded territory. Although the identity of that female was not certain, the timing of clutch initiation and the fact that she was mated to the male suggest that she was his previous mate. The pair successfully fledged four young from that nest.

Measurements of the blackbird nest used by the warblers were compared with those of 20 other nearby nests of Red-winged Blackbirds, also built in buttonbushes in 1987. All measurements of the warbler nest were similar to those of blackbird nests except for inside depth, which was greater than the upper 95% confidence limit for the other 20 blackbird nests. This fact, along with the moss lining of the nest (Prothonotary Warblers use moss in their nests; Red-winged Blackbirds do not), suggests that the warblers altered the nest cup and made it deeper.

Lack of available natural cavities or nest boxes prompted use of the blackbird nest by the warblers. The question remains as to why the male would continue to defend an area that held no suitable nest sites. Possibly, the male had been "waiting" for a territory with suitable nest sites to become available, as is often the case in this population of Prothonotary Warblers (unpubl. data). Also, Prothonotary Warblers exhibit strong site tenacity (unpubl. data). If the male had nested at this site in a previous year, his tenacity could explain why he did not move elsewhere in search of cavities. When faced with severe nest-site limitation in habitat that is otherwise preferred, Prothonotary Warblers may utilize any site that adequately resembles a cavity, even if it is of lower quality, when the alternative would be to delay or forego breeding.

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Predation on overwintering wood borers by woodpeckers in clear-cut forests.—Few researchers have assessed the impact of woodpeckers on wood borers, a complex of insect species that burrow deep into the xylem of living trees and account for a \$60–120 million annual loss of timber in the eastern United States (Donley and Worley 1976). In addition, few studies have discussed tree characteristics associated with locations of borers that were depredated, and no studies have assessed the impact of woodpeckers on wood borers in young, regenerating forests. This latter point is especially significant because of the contro-